

PROGRESS REPORT NUMBER 12 ON THE HOPI TRIBE'S INVOLVEMENT AS A
COOPERATING AGENCY IN THE GLEN CANYON DAM ENVIRONMENTAL IMPACT
STATEMENT

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Submitted to

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Introduction

According to the objectives outlined in the cooperative agreement, this report will address the progress and action that has been accomplished by the Cultural Preservation Office for the period beginning April 1, 1994 until June 30, 1994, the third quarter of the 1994 fiscal year, towards fulfillment of those objectives. This report fulfills the June 30, 1994 deliverable requirement of the cooperative agreement between the Bureau of Reclamation and the Hopi Tribe.

Progress Completed Towards Fulfillment of Objectives

The first objective is to identify sensitive cultural resource concerns to ensure that they are included in the planning phase of the Glen Canyon Dam Environmental Impact Statement.

April 8, 1994 Joint Meeting Between Hopi & Zuni

During this reporting period, Dr. Ferguson, Ethnohistorian under contract to the Cultural Preservation Office, conducted, as part of the ongoing Hopi ethnographic and ethnohistoric Grand Canyon research, attended a joint meeting of the Hopi Cultural Resources Advisory Task Team and the Zuni Cultural Resources Advisory Team held on April 8, 1994 in the Pueblo of Zuni. The purpose of this very productive meeting was to discuss two issues: 1) Zuni and Hopi traditional values and beliefs about the Grand Canyon, and 2) the Glen Canyon Dam EIS and the Glen Canyon Environmental Studies issues of concern to the Cultural Advisors.

Hopi Research River Trip

Between April 25 to May 9, Dr. Ferguson and Mr. Michael Yeatts, Hopi/GCES Archaeologist, participated in a Hopi Cultural Preservation Office river trip to conduct research in the Grand Canyon. Two Hopi Research Teams participated in the research river trip. The first team of five Hopis and two anthropologists launched on April 25 and ran the river to Pipe Creek, ca. River Mile 89, where the Hopis hiked out. A second Research Team of six Hopis hiked in a Pipe Creek and traveled the river to Diamond Creek, ca. River Mile 226.

During this river trip many Hopi names for natural resources

were documented in the photo logs at the time these plants and animals were photographed. This information was transferred to recording forms and photograph labels following the river trip. All photographs and slides were individually mounted and labeled by Dr. Ferguson for presentation to the Hopi Cultural Preservation Office as supplementary documentation of the river trip.

The Research Team on the first half of the river trip was comprised of five Hopis and two anthropologists:

Name	Age	Village	Clan
Ronald Humeyestewa	44	Mishongnovi	Bear
Gilbert Naseyouma	60	Moenkopi	Sun
Owen Numkena, Jr.	58	Mishongnovi	Corn
Rex Talayumptewa	34	Shipaulovi	Sun Forehead
Byron Tyma	62	Shungopavi	Spider
Mike Yeatts	32	--	--
T.J. Ferguson	44	--	--

The ceremonial positions held by the Hopi Research Team members are: Owen Numkena, Jr., belongs to *Wuwchim*; Byron Tyma is a Two Horn Chief (*Alataka*); Ronald Humeyestewa belong to *Dadakya*, and also belongs to the Snake Society; and Glibert Naseyouma is initiated into the Katsina group, as is everyone on the Research Team.

National Park Service archaeologists who launched with the Hopi Research Team included: Jan Balsom, Grand Canyon Park Archaeologist (Trip Leader); Lisa Leap, Assistant Archaeologist; and Lisa Whisnant, Assistant Archaeologist. The rafts were rowed by Deb Peterson, Nancy Rivers (Mackensie), Martha Clark, and Lisa Whisnant. Signa Larralde, the new Bureau of Reclamation archaeologist, was also along on the trip.

During this river trip the Hopi Research Team documented *Kele*, or Peregrine Falcon. *Kele* feathers are used during initiations. Also documented *Bavokya*, or Swallows; their feathers are used at Hopi to make prayer feathers for horses so the horses will "fly" as fast as the swallows. Many other Hopi traditional resources were documented during this trip and a list of these are presented below.

The Hopi Research Team accompanied the NPS archaeologists during the monitoring of archaeological site C:2:101, located at River Mile 9.9. The Hopis discussed and came to a general consensus that a rock pile located at this site has the surface characteristics of a human burial, i.e., the piling up of the rocks in the scatter. The Hopis also inquired if check dams or terraces would help alleviate the erosion problems at sites and further suggested that this would help alleviate the erosion,

because it works very well on the Hopi Reservation. Also during the stop at C:2:101, the Hopi Research Team documented *Songnoho* (Fragmites). This plant was recorded last year as *Songosvu*. The difference in pronunciation seems to represent linguistic variation between Second and Third Mesas.

During the river trip Ronald Humeyestewa expressed that the Bureau of Reclamation should operate the dam to protect the Grand Canyon rather than maximize revenues from power generation.

The Hopi Research Team stopped at the Supai Man Petroglyph, ca. River Mile 11.9. Owen Numkena, Jr., pointed out the line below the figure in the Petroglyph goes east possibly indicating the direction of the sun in the sky. Ronald Humeyestewa said the Supai Man Petroglyph reminds him of *Masaw*. The figure seems to be holding a pouch in his right arm. A planting stick seems to be in his left hand. *Masaw* is often depicted at Hopi carrying a planting stick and a bag of seeds. The consensus of the Hopi Research Team was that the Supai Man was a depiction of *Masaw*. Glibert Naseyouma added that the line below the Petroglyph tells the time of the year.

Mr. Humeyestewa offered his opinion that he thought it was acceptable for people to take raft trips through the Grand Canyon but that he was concerned that the Supai Man and other archaeological sites need to be protected from vandalism.

During this portion of the river trip there was a lot of discussion in Hopi about the research process, what to tell the Hopi's anthropologists, and the fact there were quite a few NPS archaeologists and boatmen participating in or listening to the discussion. Dr. Ferguson noted, in retrospect, that there were too many people not directly employed by Hopi present at this stop and that this greatly constrained establishing a good research relationship with the Hopis at the onset of the field research.

Ronald Humeyestewa said he would prefer to only give information to the Hopi tribal employees; Byron Tyma concurred. This may continue to be a problem for Hopi research into the Grand Canyon, both for this contract and for future long term monitoring research if the Hopi Research Teams are continually forced to rely on the National Park Service for their rafting logistics.

The Hopi Research Team stopped to examine archeological site, C:5:1, which has several rooms and structures, as well as many Petroglyphs. One of the Petroglyphs was identified as a Hopi migration symbol that relates to the inner Hopi Life Cycle. This site has also received recent vandalism in the form of pothunting and graffiti. Ms. Balsom asked the Hopi Research Team for their advice on the final disposition of two vessels and the human

remains that were exposed by two tourists. Ronald Humeyestewa suggested reburying the human remains and pottery in the same place they came from but placing large boulders on top to protect them.

Ronald Humeyestewa noted a Bearstrap Clan symbol at this site. The Bearstrap Clan takes its name from a device used to carry water vessels or bags of seeds. This carrying strap consisted of a wooden hoop with a strap made from bear hide.

Joining the river trip, prior to the Marble Dam site, were Warren Hurley (BOR archaeologist), Chris Coder (NPS archaeologist), Mike Stubbing (BOR surveyor), and Duane Hubbard (NPS archaeologist). The motorboat also carried the surveying equipment these archaeologists were going to use to map archaeological sites.

During the river trip, Ronald Humeyestewa said that he had skimmed the public draft of the Glen Canyon Dam EIS. In reading about the descriptions of his ancestors, Mr. Humeyestewa said he thought that the ancestral archaeology should be called *Hisatsinom*. He also thought that the EIS contained many interesting things, and that it also contained a great many very technical and scientific words. Some of the EIS was not understandable to him. All in all, however, it is a great book, in part because the Hopis contributed to it.

At River Mile 43, the Hopi Research Team examined a boulder with marks on it that Andrew Othole had observed during the Zuni Research Trip last year. Jan Balsom said Mr. Othole thought the marks on this rock were a route marker. The Hopi consensus interpretation is that the rock incorporates symbols for corn, arrow, and lightening. The Hopis couldn't really picture what the Zunis thought about the rock, but they think the line points towards the storage bins at the site.

At River Mile 61.5, the Hopi Research Team stopped at the Little Colorado River, which was flowing bright blue. Here, the Research Team decided to hike to the *Sipapuni*. The blue water and the native fish of the Little Colorado River have been described to Ronald Humeyestewa by his uncles and grandfathers. They also described beavers. Ronald Humeyestewa learned a lot about the *Sipapuni* from his godfather during the *Wutchim*. However, this information can't be shared with anyone-not even his own family, and certainly not with outsiders. He also noted that his elders didn't have names for the native fishes but they still spoke of them. He also described the landscape of the Little Colorado River as "very serene." He said the area is *Lomaheinta*, i.e., very pretty, beautiful, and pristine.

On return from the *Sipapuni*, the Hopi Research Team stopped at the "Ratshit Shelter" at Powell Canyon. The Hopi Research Team

went in and examined the pictographs. The consensus was that the pictographs were painted by people from Shungopavi. Ronald Humeyestewa thought the pictographs were executed by Hopis based on the style of drawing. Gilbert Naseyouma pointed out that the painting style indicates these were recent pictographs and not "authentic," by which he seemed to mean ancient.

The Hopi Research Team stopped at archaeological site, AZ:C:13:10, at Furnace Flats. There is a lot of active Headcut erosion occurring at this site which is threatening many archaeological features. The Research Team was asked if these archaeological features should be studied before they are destroyed by erosion. Gilbert Naseyouma said he thought the endangered deposits should be studied so they can be dated. Rex Talayumtewa and Ronald Humeyestewa agreed the site should be studied before it is destroyed. But Ronald also expressed the Hopi belief that when ruins were abandoned and left, they should be left to stay as they are. Byron Tyma also articulated this view. This is one of the issues that the Cultural Resources Advisory Task Team needs to address at Hopi.

Jan Balsom took the Hopis to look at a possible shrine that the Zunis had seen on an earlier trip. Rex Talayumtewa said when he walked over this feature he thought it was a shrine. When the feature was brought to the attention of Byron Tyma, he immediately called it a *pahoki*, or shrine. Ronald Humeyestewa pointed out that it opened to the east, as a shrine would.

The Hopi Research Team stopped at site AZ:C:13:70 where there are more eroding features, including two upright manos eroding out of the surface, with a metate adjacent to them. Ronald Humeyestewa suggested the NPS try and move the drainage away from this feature to preserve it. If the manos cannot be preserved *in situ*, Mr. Humeyestewa thought they should be moved so they are not lost entirely.

Mike Yeatts asked Ronald Humeyestewa if there was another Hopi name for the Grand Canyon and he said some people call it *Sakatuptka*, or "Blue Canyon." Owen Numkena, Jr., said he would like to see the *Sipapuni* added to the National Park as it would have more protection that way than it currently does as part of the Navajo Reservation.

On May 2, 1994, the second group of Hopis hiked in and replaced the first group comprising the Hopi Research Team. The Hopi Research Team for the second half of the trip included:

Name	Age	Village	Clan
Brad Balenquah	52	Bacavi	Snake
Leigh Jenkins	43	Bacavi	Greasewood
Fred Koruh	18	Bacavi	Snake

Walter Hamana	63	Old Oraibi	Greasewood
Orville Hongeva	47	Moenkopi	Snake
Harlan Williams	50	Mishongnovi	Eagle
Mike Yeatts	32	--	--
T.J. Ferguson	44	--	--

During the second half of the river trip Leigh Jenkins discussed the difference between "rock art" or petroglyphs vs. "rock symbols." Mr. Jenkins suggested understanding that "rock symbols" mean something to individuals on a personal level and not a tribal level of community recognized symbolism. This should not discredit or devalue the personal meaning that individuals attach to natural features or the environment. These personal meanings are important, but such features do not constitute a traditional cultural property in the sense of Bulletin 38 where those properties are important to an entire community. Rock symbols are meaningful to one person.

The Hopi Research Team stopped at site AZ:B:16:3 which consists of four low masonry enclosures on a bench above the river. The Navajo Tribe's researchers thought this site is a Navajo site. They suggested this was a prehistoric pueblo site subsequently reused by Navajos.

Leigh Jenkins expressed his thoughts that the openings of these structures towards the east does not necessarily mean these structures are hogans. Facing a structure east can highlight Hopi teachings (like the *pahoki*), or, more practically, facing east might be done to heat the building up faster in the morning.

Leigh Jenkins expressed that the Hopi Tribe doesn't want to make politically oriented claims of cultural affiliation. Ms. Balsom noted that the local Navajo Chapters adjacent to the Grand Canyon don't make claims about the Grand Canyon, it is the people in Window Rock that do.

The Hopi Research Team stopped at site AZ:B:10:225, a rock shelter and roasting pit on the left side of the river near Fossil Rapid. Here, Leigh Jenkins had a long discussion about roasting features and how they may have been used. He thinks Hopi cultural practices suggest two other uses in addition to agave cooking: 1) roasting meat from small game or rabbits obtained during ritual rabbit hunts; 2) heating stones for sleeping on top of them. This was based on the morphology of this archaeological site.

The Hopi Research Team stopped at site AZ:B:10:1, a rock shelter. This site is deteriorating. In the past three years there has been problems with people digging at this site. There is no plan by the NPS to excavate this site only continue to fill in pothunter's holes. This site is monitored each year. Leigh Jenkins suggested more frequent monitoring if vandalism is a

Harlan Williams noticed a hearth-like structure at B:10:1 on the far downstream end of the site. Walter Hamana suggested that this may be a shrine rather than a hearth. This feature face in the right direction with respect to the winter sun to be a shrine. Walter said villages have shrines in plazas used during ceremonies. These shrines have three sides; one side is open.

Signa Larralde asked if the presence of a shrine made a site more sensitive. Walter Hamana said every site is sensitive, therefore shrines don't make sites more sensitive.

During the river trip it occurred to Leigh Jenkins that the second half to the Grand Canyon is less important than the first half in terms of Hopi interests. Leigh thought the Pais might want to claim and monitor the sites along the western half of the Grand Canyon and that is alright with him. Leigh further emphasized that Hopi doesn't want to politicize the cultural affiliation claims.

List of Hopi Names for Plants and Animals Recorded During the River Trip

<i>Hopi Name</i>	<i>Common Name</i>
Bacavi	reeds
Bavokya	Swallow
Kele	Peregrine Falcon
Kevepsi	Hackberry
Koyongo	turkey
Kwaani	Agave
Kwivi	spinach
Leimansi	Evening Primrose
Masikhawi	Willow(?)
Mahuvi	Snakeweed
Moho	yucca
Nasingpu	shedded snake skin
Ova	grape
Piiva	Indian tobacco
Samowa	agave/yucca
Songnoho	Fragmites
Suta	red hematite
Suvapi	Mormon Tea
Tawamana	warbler
Tcua	rattlesnake
Toho	Mountain Lion
Tokloogan	snake
Totolo	grasshopper
Tsimona	Datura
Tumi	wild spinach
Qahavi	Willow
Wi'pho	cattail
Yalaha	specular hematite(?)

Qahavi	Willow
Wi'pho	cattail
Yalaha	specular hematite(?)
Yongo	Prickly Pear
????	Brittle Bush

During this river trip, Dr. Ferguson took several hundred photographs and 177 pages of field notes documenting Hopi research activities. This information will be used in the preparation of the final project report.

May 13, 1994 Joint Meeting of Hopi and Zuni

On May 13, 1994, Dr. Ferguson, Mr. Yeatts, and Kurt Dongoske attended a special meeting of the Hopi and Zuni Cultural Resources Advisory Teams at the Hopi Cultural Center to discuss GCES issues; primarily focusing on the role of the National Park Service in protecting and preserving the shared cultural heritage of these two cultures.

During this meeting the Hopis and Zunis discussed an organized fall river trip at which time the two tribes will discuss the treatment of archaeological sites and traditional cultural properties. Andrew Othole, representative from Zuni, said that sites are not only important as habitation places, but what happened prior to habitation; such as sacred offerings placed.

Also during this meeting, the National Park Service's responsibilities under the Native American Graves Protection and Repatriation Act were discussed. Hopi and Zuni want a joint Memorandum of Understanding with the Park Service to handle the issues associated with Puebloan human remains, associated funerary objects, sacred items, and objects of cultural patrimony. Leigh Jenkins expressed that the position of the Cultural Preservation Office is that an agreement document is important not only to provide for Hopi interests and concerns, but it also will help facilitate administrative decisions by the National Park Service. Mr. Jenkins added that it is the Tribes' responsibility to hold the National Park Service to their legal obligation under the law.

Mr. Othole agreed with Mr. Jenkins, and further added that the Zuni need to have an agreement document that deals with pueblo remains. This document should reflect the cultural heritage and ties for hundreds of years of the Zunis association to the Canyon.

Ronald Humeyestewa expressed that during the river trip Hopi members identified a grave eroding at the Furnace Flat site and identified human bone. He suggested that perhaps these remains could be excavated and reburied on another portion of the site or

should we just let the remains erode? Most of the sites within the Canyon are *Hisatsinom* and we should place rocks over the exposed portion of the grave

Mr. Othole stated that Zuni would want to have reburial as close to the original location as possible and does not encourage curation because that will pose problems for the Zuni and the Park Service.

As a result of this meeting, both Hopi and Zuni requested that the National Park Service have a draft NAGPRA Memorandum of Agreement document submitted to the tribes by July 30, 1994.

May 27, 1994 CRATT Meeting at Hopi

Mr. Yeatts and Dr. Ferguson also attended the regular monthly meeting of the Hopi Cultural Resources Advisory Task Team on May 27, 1994 in Kykotsmobi to make a river trip report. Also at this time, Dr. Ferguson transmitted two work products to the Cultural Preservation Office, i.e., two 3-ring binders containing all of the labeled photographs and labeled slides taken during the river trip.

Grand Canyon Workshop for Dr. Ferguson

On June 1 and 2, 1994 Dr. Ferguson attended a field seminar presented by Ramson Lomatewama on the "Meaning of the Grand Canyon for the Hopi People." This was a valuable workshop for Dr. Ferguson as it clarified many aspects of Hopi history and anthropology relating to the Grand Canyon.

Ethnographic Interviews

On June 3, 1994 Dr. Ferguson and Walter Hamana, Research Assistant for the Cultural Preservation Office, interviewed Ronald Humeyestewa and Owen Numkena, Jr., to document their thoughts and experiences during the May river trip through the Grand Canyon.

Other work performed by Dr. Ferguson

Dr. Ferguson prepared a draft of the field notes he took during the May river trip and presented copies to the Cultural Preservation Office. The document is 70 pages in length.

Also during this quarter, Dr. Ferguson annotated 5 references and submitted these annotations to the Cultural Preservation Office.

The second objective concerns assisting the GCD-EIS writing team in assessing the relative sensitivity of various cultural resource types. The ongoing process of fulfilling this objective

has been and continues to be primarily facilitated by Dr. Steven W. Carothers, of SWCA, Inc., who is under contract to the Cultural Preservation Office of the Hopi Tribe to represent the Hopi Tribe on the EIS Writing Team.

Hopi Tribe's Draft EIS Comments

On April 5, 1994 the Hopi Tribe transmitted their comments on the public draft of the Glen Canyon Dam Environmental Statement. The Hopi comment document was 36 pages in length and focused primarily on the quality of the interpretation of the fishery research and data.

Specifically, the Hopi Tribe was concerned that the lengthy Cooperative Agency deliberative process and its conclusions were largely modified without the support of the Cooperating Agencies. It has been the position of the Hopi Tribe that the U.S. Fish and Wildlife Service (USFWS), without sufficient biological justification, negated the findings of the EIS Team and the Cooperating Agencies by imposing their Reasonable and Prudent Alternative (RPA) as the Preferred Alternative presented in the Draft EIS. The Hopi Tribe had a number of objections to this approach.

First, it corrupted the cooperative and democratic approach that had been established in the EIS process. The Hopi Tribe participated in this process in good faith, with the goal of identifying dam operations that would minimize adverse impacts to the resources in question. The Hopi Tribe understood that our representatives would work together with other members of the EIS Team and with other Cooperating Agencies in a spirit of collaboration and open discussion to select a preferred alternative. The Hopi Tribe believes that we have fulfilled our responsibility. After long, thoughtful, and, at times, difficult debate, all the Cooperating Agencies, except the USFWS, agreed on a preferred alternative: the original Modified Low Fluctuating Flow (MLFF). Then, shortly before the Draft EIS was to go to press, the USFWS and the BOR met behind closed doors and substituted a different preferred alternative (under the same name), essentially the USFWS's RPA as reported in their recent Biological Opinion (USFWS, 1993).

Secondly, the Hopi Tribe believed that the imposition of the RPA as the Preferred Alternative places the EIS in the untenable position of recommending an unevaluated flow regime. Every alternative, except the Preferred Alternative, has been analyzed for its impacts on every resource in question. Summaries of those impacts appeared in Table II-7 and in tables throughout Chapter IV. None of the tables were included in the Preferred Alternative; although they appeared to. The MLFF Alternative which is evaluated, and which readers were told elsewhere is the Preferred Alternative, is actually the original

Preferred Alternative (year-round low fluctuating flows). No impacts are reported for the altered Preferred Alternative, which is a combination of low fluctuating flows and seasonally adjusted steady flows. The Draft EIS glossed over this shortcoming by inserting a boilerplate paragraph in the text of every summary. This paragraph varies slightly from section to section, but basically it indicated that potential impacts from the research flows cannot be included because their frequency and results are unknown. Readers are usually assured, however, that impacts fall somewhere between those of the MLFF and those of the SASF alternatives. This lack of precision reflected a last minute and less than well-thought-out alteration of the Preferred Alternative. It was particularly troubling to the Hopi Tribe that an evaluation could not be made even in the Endangered and Special Status Species section, as it is precisely for the native fish that the USFWS insisted that the changes be implemented.

Third, the Hopi Tribe questioned the legality of recommending an alternative (the Preferred Alternative) that describes flows intended for endangered fish research yet gives no indication of how frequent the flows will be, nor any analysis of whether the flows could be hurtful to the endangered fish in question. There is reason to believe that the proposed steady flows could actually be detrimental to these fish by strengthening competitive and predation pressures from non-native fish. The USFWS, in their RPA (USFWS, 1993), failed to seriously address this concern or to provide any safeguards against its eventuality.

Fourth, the Hopi Tribe did not concur with the logic of giving research steady flows such high priority in the Preferred Alternative. From the Hopi Tribes reading of the RPA, even if these flows were to result in increased mainstem numbers of endangered fish, conditions necessary for the removal of jeopardy from the humpback chub still would not be met. Additionally, it did not appear that anything done in Grand Canyon could lift jeopardy from the razorback sucker. The USFWS has identified Colorado River water temperature as the "central issue" to be resolved in the recovery of these fish. Unless the water is warmed, the humpback chub cannot spawn in the mainstem, and unless they can spawn in the mainstem, their reproduction is virtually limited to one location, the Little Colorado River. The USFWS will not rescind the jeopardy ruling for the humpback chub until the fish establish at least one additional spawning population. Therefore, mainstem water temperatures, not flows, are the key. It seemed prudent to the Hopi Tribe to resolve questions surrounding selective withdrawal before embarking on costly and inconclusive steady flow experiments.

Finally, in the Hopi Tribe's opinion, the new Preferred Alternative did not attempt to balance all resource needs. Its sole focus was on native fishes, irrespective of potential

negative effects to other resources. This lack of balance for all potentially impacted resources is a serious flaw in the current Preferred Alternative. In the past, the dam was operated on the basis of maximizing a single resource, hydropower. Substituting another management policy with an alternate but equally myopic focus is not a step forward. Only through a holistic, ecosystem wide management approach can all resource concerns be balanced.

Long Term Monitoring Meeting for Biological Resources

On April 6, 1994, Mike Yeatts attended the Long Term Monitoring Meeting for Biological Resources at the Arizona Game and Fish Offices in Flagstaff, Arizona. The outcome of this meeting is the reconstituting of the Glen Canyon Environmental Studies Scientific Coordination Group.

Non-Use Value Economics Committee Meeting

On April 29, 1994, Mr. Dongoske attended a meeting of the "Non-use Value Economics Committee" in Las Vegas, Nevada. This meeting was essentially a presentation to the committee the results of the sample survey conducted and analyzed by HBRS. The results of the survey and the consensus indicated that the full blown survey is warranted and would be useful. The sample survey also indicated that the American public seems concerned about Native American issues as they relate to the Grand and Glen Canyons and the operations of the dam. This is encouraging for the Native American entities participating in the Glen Canyon Dam EIS.

May 10 & 11, 1992 Cooperating Agencies Meeting

On May 10 and 11, 1994 Mr. Dongoske and Dr. Carothers attended the Cooperating Agencies Meeting in Phoenix, Arizona. On May 10, 1994 Mr. Dongoske and Dr. Carothers attended an executive session of the Cooperating Agencies, which was called for by the Hualapai Tribe, to discuss the designing of the Adaptive Management Program.

Mr. Dongoske and Dr. Carothers represented the Hopi Tribe at the Cooperating Agencies meeting on May 11, 1994. During this meeting the Hopi representatives became aware of a meeting held in morning of May 10 at Sky Harbor Airport between Ms. Barbara West, DOI, Mr. Raymond Gunn, NPS, Mr. Bill Jackson, NPS, Mr. Boyd Evison, NPS, Ms. Jan Balsom, NPS, Mr. Jake Hougland, NPS, Mr. Rick Gold, BOR, Mr. Lee McQuivey, BOR, Mr. Stan Ponce, BOR, and Jack Schmidt, Utah State University. The purpose of the meeting was to discuss a proposed long-term monitoring program developed by representatives of the National Park Service.

The essence of this proposal is to establish a Glen Canyon Dam long-term monitoring structure under the direct auspices of

the Secretary of the Interior's office. The effective result of this proposal, and apparently its purpose, would be to bypass the Glen Canyon Environmental Studies and substantially reduce the influence of BOR in the management of Glen Canyon Dam. The NPS propagators of this plan apparently believe that BOR currently exercises too much control over the riverine environment in Grand Canyon National Park, and NPS exercises too little.

NPS has gone so far as to seek approval of the plan from the Secretary of the Interior's office. Their intent seemed to be to maneuver behind the scenes, develop political backing, then present the plan as a *fait accompli*.

The concealed actions of the National Park Service in the development of the long-term monitoring and adaptive management program outside of the cooperative process established by the Cooperating Agencies seriously concerned the Hopi Tribe. It was the position of the Hopi Tribe that the Park Service was unilaterally attempting to control the long-term monitoring and the management of the Glen Canyon Dam. This represented serious consequences for the Hopi Tribe as a equal and active participant in the management of traditional, sacred, and ancestral resources within the Grand and Glen Canyons. In response, the Hopi Tribe sent a letter, under the Chairman's signature, to the Superintendent of the Grand Canyon National Park requesting a copy of draft NPS proposal and that it be sent to all the Cooperating Agencies for discussion at the next Cooperating Agencies Meeting on June 28 and 29, 1994.

EIS Writing Team Meeting

On May 12, Dr. Carothers and Mr. Yeatts attended the EIS Writing Team Meeting in Phoenix, Arizona. Mr. Yeatts is reviewing and developing response for all the public comments to the draft EIS that deal with cultural resources. Dr. Carothers has been selected to a sub-group of the EIS Writing Team to review and revise the sections on the fisheries in the Glen and Grand Canyons for the final EIS.

American Fisheries Meeting

On June 22, Dr. Carothers and Mr. Yeatts attended the American Fisheries Meeting in Flagstaff, Arizona. The focus of the meeting was presentation and review of the Glen Canyon Environmental Studies fishery research within the Colorado River.

Selective Withdrawal Structure Meeting

On June 23, 1994, Mr. Yeatts and Mr. Dongoske attended the a meeting on the risk assessment of the selective withdrawal structure for the Glen Canyon Dam. This meeting was hosted by the Bureau of Reclamation and held on the campus of Northern Arizona

University.

June 28 & 29, 1994 Cooperating Agencies Meeting

On June 28 and 29, Mr. Dongoske and Dr. Carothers attended the Cooperators Meeting held at the Pointe at Tapatio Cliffs Hotel in Phoenix, Arizona. At this meeting the NPS distributed their draft version of the long-term monitoring plan, the BOR distributed their version of a long-term monitoring plan, and a joint BOR/NPS proposal for long-term monitoring and adaptive management plan was distributed. The Cooperators had the evening of June 28 to review the various versions of long-term monitoring and adaptive management. Official comments are requested by BOR from the Cooperators by July 15, 1994. The Hopi Tribe is currently reviewing the document.

The third objective concerns assisting the Glen Canyon Environmental Studies in the identification and interpretation of sacred Hopi sites and other sensitive aspects that are related to the archaeological sites.

Archaeological Survey of the LCR

Towards the completion of this objective, Mr. Michael Yeatts, Hopi/GCES Archaeologist, organized and conducted a cultural resources inventory of the lower Little Colorado River Gorge, from Blue Springs to the confluence with the Colorado River. Currently, Mr. Yeatts is compiling the results of this inventory into a report format. As apart of this compilation Mr. Yeatts is working closely with Dr. Ferguson to gather traditional Hopi information concerning traditional cultural properties and sacred areas within the survey corridor.

During the survey of the Little Colorado River Gorge, Mr. Yeatts was assisted by two Hopi men, both of whom were not initiated individuals and lacked the traditional knowledge that Mr. Yeatts required to fully assess and identify those areas of importance to the Hopi. Thus, this traditional information must now be acquired and to this end, Mr. Yeatts and Dr. Ferguson, during each Hopi Research river trip, have accompanied the Hopi Research Teams up to the Little Colorado River to the *Sipapuni* to gather some of this traditional information.

Hopi/Zuni Joint River Trip

Currently, the Hopi and Zuni Tribes are planning a joint river trip in September. The purpose of this river trip is to discuss issues of importance to the Tribes regarding the management and preservation of traditional, sacred, and ancestral places within the Grand and Glen Canyon. During this river trip the NPS archaeologist will be specifically asked not to accompany the Hopi and Zuni research teams.

Hopi Review of NPS Monitoring Reports

Mr. Dongoske and Mr. Yeatts reviewed the draft summary report for Glen Canyon Monitoring Reach for 1993 and reviewed the Grand Canyon Monitoring Report for 1992. Both of these documents provide little objective information regarding the status of the archaeological sites being monitored. It is difficult, if not impossible, for independent tribes, the SHPO, or the ACHP to effectively evaluate these documents. This then calls into question the National Park Service's ability to effectively carry out their consultative requirements of the Programmatic Agreement. Currently, Mr. Dongoske is organizing a meeting of the Native American Cooperators to discuss the adequacy and effectiveness of the consultative process as identified in the Programmatic Agreement.

Other Efforts Towards the Completion of this Objective

Mr. Yeatts, who is stationed at the GCES offices in Flagstaff, is the Hopi Cultural Preservation Office's representative at numerous meetings regarding all aspects of the Glen Canyon Environmental Studies. These include meetings on economics, fish studies, EIS writing team meetings, non-use value economics, and GCES staff meetings.

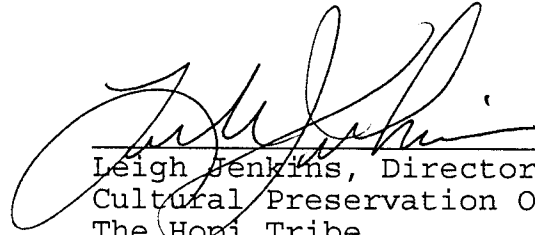
Mr. Yeatts will continue to monitor the Section 106 consultation process, between the Bureau of Reclamation, the National Park Service, the Arizona State Historic Preservation Office, the Advisory Council on Historic Preservation, and the concerned Native American Tribes. Throughout this process, Mr. Yeatts and Mr. Dongoske have been instrumental in commenting on and directing the development of the Programmatic Agreement and the associated Monitoring Plan for the treatment and consideration of Hopi concerns and cultural and historic properties within the Glen and Grand Canyons.

The fourth objective of the Hopi Tribe's involvement in the Glen Canyon Dam Environmental Impact Statement addresses Hopi assistance to the GCD-EIS writing team in the development, writing, and review of the environmental documents. This objective has been previously addressed by outlining the Cultural Preservation Office's actions and continuing involvement with the GCD-EIS and the GCES process under objective #2 and the involvement of Mr. Yeatts and Mr. Ferguson in the compilation and preparation of various documents that are submitted to the GCD-EIS writing team.

The above summarizes the Hopi Tribe's involvement as a Cooperating Agency in the development of the Glen Canyon Dam Environmental Impact Statement as of June 30, 1994. If you should have any questions concerning this progress report or if you need additional information please contact Mr. Leigh Jenkins,

Director, or Mr. Kurt Dongoske, Tribal Archaeologist, at 602/734-2441, extension 202, or 602/734-6636.

REVIEW AND CONCURRENCE

A handwritten signature in black ink, appearing to read "Leigh Jenkins", is written over a horizontal line.

Leigh Jenkins, Director
Cultural Preservation Office
The Hopi Tribe



INC. ENVIRONMENTAL CONSULTANTS

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(602) 774-5500 • FAX (602) 779-2709

AUG 5 1994

3 August 1994

Mr. Leigh Jenkins, Director
Hopi Cultural Preservation Office
P.O. Box 123
Kykotsmovi, Arizona 86039

*noted
JG 8/15/94*

Dear Mr. Jenkins:

This letter report summarizes SWCA activities for July 1994 relative to the Glen Canyon Dam Environmental Impact Statement (EIS). Developments and issues addressed in the last month include negotiations to arrive at a preferred alternative in the Final EIS, response to Draft EIS comments, EIS document revisions, and Adaptive Management/Long-term Monitoring uncertainties.

The progress made to date (at least at the local level--we have yet to hear from Washington) toward a low fluctuating flow preferred alternative, and changes now being drafted in the EIS document relative to endangered fish, amount to a victory for positions advocated by the Hopi Tribe. The major outstanding concern, and it is a significant one, involves the role of the Hopi Tribe and other Native American groups in the Adaptive Management Program.

MEETINGS ATTENDED BY STEVEN CAROTHERS

July 14, 1994

AQUATIC BIOLOGY (AB) TEAM MEETING; Flagstaff, Arizona

July 21-22, 1994

EIS TEAM MEETINGS; Flagstaff, Arizona

ISSUES RELATING TO THE PREFERRED ALTERNATIVE

On 6 July, representatives of the Bureau of Reclamation (BOR) and the U.S. Fish and Wildlife Service (USFWS) met in an attempt to resolve differences between BOR's proposed preferred alternative and USFWS's Reasonable and Prudent Alternative (RPA) as set forth in the Draft Biological Opinion. The principal disagreement centers on whether endangered fish research flows (the steady flow experiment) should be part of the preferred alternative or relegated to Adaptive Management.

USFWS contends in their RPA that low, steady summer flows are a requisite for removing jeopardy and must be mandated by the Record of Decision in the form of a 5- to 10-year experiment. In contrast, BOR plans to move experimental steady flows out of the preferred alternative and into the Adaptive Management process so

Mr. Leigh Jenkins
June 30, 1994
Page 2

the flows would not be mandated by the Record of Decision. In a second point of contention, USFWS wants BOR to take responsibility for a Little Colorado River (LCR) management plan as an element of the preferred alternative. BOR does not believe that management of the LCR is within their jurisdiction, and has no interest in accepting either financial or leadership responsibilities. They insist that the LCR management plan be removed from the RPA and be treated as a conservation measure, with another entity, possibly the Navajo Nation, taking the lead (a possibility that has serious implications for Hopi tribal involvement).

USFWS and BOR appeared to reach a partial compromise on 6 July. The senior USFWS representative at the meeting agreed to accept the experimental flows as part of Adaptive Management if 1) preparatory studies (data collection, risk assessment, and research design development) are completed by the end of 1997, and 2) BOR proceeds with the experimental flows in 1998 if this deadline is not met.

Despite this tentative agreement, the differences between BOR and USFWS have yet to be resolved.

DRAFT EIS COMMENTS and EIS REVISIONS [Comment responses assigned to SWCA appended]

SWCA hosted a meeting of the EIS Aquatic Biology Team on 14-15 July. This group, composed of representatives of BOR, USFWS, the Arizona Game and Fish Department, the Hualapai Tribe, and the Hopi Tribe (SWCA), discussed and resolved several issues pertaining to the treatment of endangered fish in the EIS document. Several sections, particularly chapters III and IV, were revised to 1) more accurately describe predam conditions, 2) emphasize threats posed by exotic fish predation and competition, 3) better reflect the degree of uncertainty and difference of opinion in the scientific community about the status of native fish and the effects of steady flows. These changes address most of the concerns expressed by the Hopi Tribe in their Draft EIS comments.

At the end of the meeting, each AB Team member was asked to develop responses to specific comments and to submit Draft EIS text changes as appropriate. SWCA was assigned a total of 61 comments from the following organizations: the Hualapai Tribe, National Park Service (NPS), Arizona Game and Fish Department, American Fisheries Society, Salt River Project, and American Rivers. Copies of these comments and SWCA responses are attached.

The AB Team will also compose summary responses to hundreds of additional aquatic biology-related comments received from other organizations and individuals. Comment responses will appear in a separate volume in the Final EIS.

Mr. Leigh Jenkins
June 30, 1994
Page 3

ADAPTIVE MANAGEMENT AND LONG-TERM MONITORING

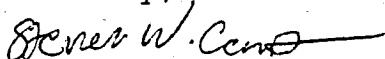
Native American involvement in Adaptive Management continues to be a concern. While Native American representation does appear on both the Adaptive Management Work Group (policy-making level) and the Technical Work Group (administrative level) in the joint NPS-BOR Adaptive Management proposal, the degree of involvement remains problematic. We have reason to believe that NPS and the National Biological Survey, key players in the proposed Adaptive Management structure, would not welcome Native American participation to the degree that BOR and Glen Canyon Environmental Studies (GCES) has in the past. The fact that NPS dropped Native American representation from the Technical Work Group in their draft Adaptive Management proposal supports this suspicion. David Wegner (per. comm.) of GCES has reported to us that some local representatives of these agencies consider research conducted under Native American aegis to be sub-standard. The Hopi Tribe may be looking at significantly reduced levels of funding and involvement in Glen Canyon Dam management decisions in the future.

A second concern that must be addressed is whether research activities can be carried out effectively over the next three years given the proposed shift from GCES to the proposed Adaptive Management structure. At this point, Adaptive Management is nothing more than a sketchy proposal on paper. Creating a complex, three-tiered organization, including a functioning research center; staffing the center; issuing research contracts; etc.; while simultaneously implementing the three-year research program preparatory to endangered fish experimental steady flows may be impossible. This preparatory research program is critical for the development of a successful steady flow experiment. The well being of endangered and other native fish is at stake, as is the investment of tens of millions of dollars in lost power revenues.

MONTHLY INVOICE

Attached is a copy of the invoice for July 1994. The original was sent to the Office of Grants/Contracts Administration along with copies of receipts for expenses, as requested by that office.

Sincerely,



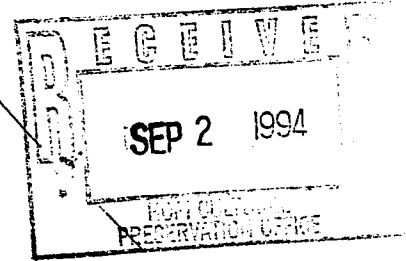
Steven W. Carothers, Ph.D.
Project Manager

enclosures

THE INSTITUTE OF THE NORTH AMERICAN WEST

Executive Office
110 Cherry Street, Suite 202
Seattle, Washington, 98104
206/623-9597

Southwest Programs
5000 W. Placita de los Vientos
Tucson, Arizona 85745
602/743-3229



MEMORANDUM

To: Leigh Jenkins, Director, Hopi Cultural Preservation Office
Through: Kurt Dongoske, Hopi Tribal Archaeologist
From: T. J. Ferguson
Date: August 31, 1994

Subject: Monthly Progress Report #38/For Hopi GCES Project

This report details progress made on ethnohistoric research for the Hopi Tribe's Glen Canyon Environmental Studies Project during the month of August, 1994. A total of 80 hours was expended by T. J. Ferguson, as documented in Invoice #11 for FY 1994.

Most of my time in August was spent in research and preparation of the final project report. Towards this end, a substantial effort was made to annotate the research materials collected during the course of the project. A total of 73 annotations were completed, a list of which is attached to this report. Copies of the annotations are also transmitted with this report.

Forty-six historical maps were examined for information pertaining to Hopi use of the Grand Canyon and surrounding region. A list of these maps with brief notes is appended to this monthly report.

The field notes I took taken during from the Hopi river trip from April 25 to May 9, 1994, were revised and corrected as per the editorial emendations of Leigh Jenkins. Two copies of these final field notes are transmitted with this report. One copy is provided in a three-ring binder for the use of Leigh Jenkins. The other unbound copy is provided for the files of Kurt Dongoske. A third copy of the field notes has been provided to Mike Yeatts.

On August 25, 1994, I attended a meeting of the Hopi Cultural Resources Advisory Task Team and provided a progress report on our ethnohistoric research. In addition, I was able to tape record a valuable oral report by Tribal Chairman Ferrell Secakuku in which he discussed his recent GCES river trip.

cc: Mike Yeatts

GCES Annotations Completed in August, 1994

<i>Name</i>	<i>Date</i>	<i>Short Title</i>
Aitchison	1985	<i>A Naturalist's Guide to Hiking the Grand Canyon</i>
Annerino	1986	<i>Hiking the Grand Canyon</i>
Balsom	1993	Native Americans of the Grand Canyon in <i>Hiking the Grand Canyon</i>
Bartlett	1942	Letter to Alfred Whiting, November 9, 1942
Coder	1994	Letter to T. J. Ferguson
Crampton	1988	<i>Ghosts of Glen Canyon, History beneath Lake Powell</i>
Euler	1988	Aspects of Hopi Land Use and Occupancy
Euler and Dobyns	1971	<i>The Hopi People</i>
Hammond & Rey	1940	<i>Narratives of the Coronado Expedition</i>
Hopi Tribe	1930	Petition to Commisioner of Indian Affairs
Hopi Tribe	1979	<i>The Hopi Perspective, Message to 96th Congress</i>
Kelsey	1991	<i>Canyon Hiking Guide to the Colorado Plateau</i>
Lomahaftewa	1933	Letter to Senate Subcommittee on Indian Affairs
Martin & Martin	1982	<i>Contours of Discovery, Printed Maps ...</i>
MNA	1968	Site Cards for Hopi Salt Trail
Monogyne	n.d.	Holding Fast to the Path of Peace (A Traditional View)
Morris	1928	An Aboriginal Salt Mine at Camp Verde
Murdock	1934	<i>Our Primitive Contemporaries</i>
Murphy	1911	Map Showing Territory Claimed by Older Moquis
Murphy	1928	<i>The Snake Dance People and Their Counry</i>
Nelson	1937	<i>Rhythm for Rain</i>
Nequatewa	1967	<i>Truth of a Hopi</i>
NPS	n.d.	Art and Architecture of the Painted Desert Inn
Numkema	1967	Interview by Charles Peterson
O'Kane	1953	<i>The Hopis, Portrait of a Desert People</i>
Page	1940	Hopi Land Patterns
Page	1982	Inside the Sacred Hopi Homeland
Parnell	1986	Letter to Bob Dawson
Parsons	1921	The Pueblo Indian Clan in Folk-Lore
Parsons	1939	<i>Pueblo Indian Religion</i>
Peterson	1971	The Hopis and the Mormons
Polingyouma	n.d.	Salt Trail to Grand Canyon though Moencopi
Potter & Drake	1989	<i>Lake Powell, Virgin Flow to Dynamo</i>
Quartaroli	1990	Controversial Book Review: <i>The Hopi Salt Trail</i>
Reed	1952	The Tewa Indians of Hopi Country
Reilly	1973	The Refuge Cave
Richardson	1965	<i>Two Guns, Arizona</i>
Riley	1987	<i>The Frontier People ... Protohistoric Southwest</i>
Schwartz	1965	Historical Analysis and Synthesis of Grand Canyon Archaeology
Schwartz	n.d.	<i>On the Edge of Splendor</i>
Scientific American	1878	The Canons of the Colorado

GCES Annotations Completed in August, 1994

<i>Name</i>	<i>Date</i>	<i>Short Title</i>
Sekaquaptewa	1972	Preserving the Good Things of Hopi Life
Sekaquaptewa	1969	<i>Me and Mine</i>
Simmons (ed)	1942	<i>Sun Chief</i>
Smith	1972	The Colorado River
Smith	1952	<i>Kiva Mural Decorations at Awatovi and Kawaika-a</i>
Spangler	1986	<i>On Foot in the Grand Canyon</i>
Stephen	n.d.	A Genesis Myth of the Tusayan
Stephen	1891	Wiki Tells His Tradition
Stephen	1891	Letter to J. W. Fewkes
Stephen	1891	Memo of 12/6/1891
Stephen	1894	Letter to J. W. Fewkes
Stephen	1929	Hopi Tales
Stephen	1936	<i>Hopi Journal of Alexander M. Stephen</i>
Stephen	1940	Hopi Indians of Arizona
Stoffle	1990	Holistic Conservation and Cultural Triage
Tarbet	n.d.	The Essence of Hopi Prophecy
Tessman	1986	National Register of Historic Places Inventory - Tutuveni
Thompson	1950	<i>Culture in Crisis, A Study of the Hopi Indians</i>
Thompson & Joseph	1947	<i>The Hopi Way</i>
Titiev	1944	<i>Old Oraibi, ... Hopi Indians of Third Mesa</i>
Voth	1905	<i>The Traditions of the Hopi</i>
Wallis & Titiev	1945	Hopi Notes from Chimopavy
Watson	1943	How the Hopi Classify their Foods
Whiteley	1993	The End of Anthropology (at Hopi)?
Whiteley	1988	<i>Deliberate Acts</i>
Whiteley	1988	<i>Bacavi, Journey to Reed Springs</i>
Whiting	1939	<i>Ethnobotany of the Hopi</i>
Wilson	1965	<i>William Wolfskill, 1798-1866</i>
Winship	1922	<i>The Journey of Coronado ...</i>
Winslowe	1969	Ancient Salt Trails
Yamada	1957	<i>The Great Resistance</i>
Yava	1978	<i>Big Falling Snow</i>

Date	Name	Publisher/Cartographer	Scale	Archive	Catalog Number	ONHIR Notes	Other Notes
1669	Amerique Septentrionale	Sanson, Paris		ASU	3300.1969.M8	Shows Zuni and other tribes but not Hopi, although "Zagato" may be a Hopi village? Ojo de S. Jose between Zuni and Moqui	Republished 1969, Mus. of New Mexico; many cartographic fallacies
1776	"Map of New Mexico with Latest Discoveries"	Miera y Pacheco	ca. 1:2,880,000	Yale (Beinecke)			Shows "Tierra de los Coninas to West of Moqui; Yutas Payechis on Rio Navajoo (San Juan River) to north
1776	"Map embracing the Provinces of Sonora, the Pimerias, Papagueria, Apacheria, the Gila and Colorado Rivers, and lands discovered as far as ... Oraibi ..."	Galvin (editor), 1965, A Record of Travels in Arizona and New Mexico	ca. 1 in = 22 leagues			Zuni located to NE of Oraibi; Little detail in this portion of map illustrating areas beyond where Garces actually traveled.	Garces' route from Havasupai to Oraibi follows the south rim of Grand Canyon, then detours to SE along the LCR to avoid the Gorge then turns back north and east to Third Mesa
1810	A Map of New Spain from 16 to 38 degrees North Latitude	Alexander de Humboldt				Little detail in ONHIR area	This map contains many inaccuracies; Oraibi is located south of Puerto de Bucareli (LCR)
1846	A New Map of Texas, Oregon, and California with regions adjoining, compiled from the most recent authorities	S. Augustus Mitchell, Philadelphia	ca. 1:6,969,600	ASU	3300.1846.M56	Shows Moquis but not Zunis	Great Spanish Trail; Many cartographic fallacies in drainages; "Great Interior Basin;" Map gives mileage along "Emigrant Route from Missouri to Oregon
1848	Mexico and Guatemala	Augustus Mitchell	1:12,672,000	ASU	G4330.H5X Folio X/4B	Zuni and Gualpa located	Cosninas Indians west of Moquis; Great Spanish Trail to North of Hopi leads to Santa Fe & called Caravan Route to East of Santa Fe
1849	Map of California, New Mexico, Texas	H.S. Tanner	ca. 1:5,068,800	ASU	3300.1849.T25	Zuni and Moqui shown; but little detail; hydrography of Colorado R. is sketchy and distorted; LCR does not appear	Cosninas Indians to West of Moqui; "The Moquis have maintained their independence since the year 1680;" Fremont's Route shown;
1851	Map of the Territory of New Mexico, Compiled by Bvt. 2nd Lt. Jno. G. Parker, USTE, assisted by Mr. Richard H. Kern	R. H. Kern	ca. 1:2,880,000	ASU	4300.1851.U51B	"Proposed Wagon Road from the Pueblo of Zuni ... a Spanish Trail surveyed by Lt. Simpson ...;" Follows Zuni River to LCR; Moquis Pueblos shown	"By order of Bvt. Col. Jno Munro, USA Comdg. 9th Mil. Dept.; published in Santa Fe; original in Nat. Archives
1853	Map of the Southwestern Part of New Mexico ... drawn by Capt. S. Eastman, U.S.A.	Lippincott, Grambo & Company	ca. 1:3,801,600			Shows route from Zuni to Fort Defiance to "The Seven Moqui Towns;" LCR, Colorado, & San Juan fairly accurate	Navajos to north and east of Moquis; Cosninas to west of LCR; Published in Schoolcraft 1854, Part IV
1853	Map No. 2, Reconnaissance and Survey of a Railway Route from Mississippi ... Pacific...	Lieut. A. W. Whipple	ca. 1:1,176,685			Route through Zuni to Jacobs Well, Navajo Spr, across Rio del Lara (Dead Wash), to LCR; Also Sitgreaves route down Zuni River.	Need to examine rest of map.
1855	Territories of New Mexico and Utah	J. H. Colton	ca. 1:7,040,000	ASU	4300.1855.C61A	Route through Zuni to Puero R. to LCR	Hopi doesn't appear on map
1856	A New Map of the State of California, The Territories of California, Oregon, Washington, Utah and New Mexico	Charles Desilver	ca. 1:7,920,000	ASU	4050.1856.D45	No details west of Zuni; Hopi does not appear; Railroad route is shown through Zuni;	Drainage of Little Colorado R. is wrong; Zuni R. flows into Salt R.; Publisher: Charles Desilver, 251 Market Street, Philadelphia
1857	Territory of New Mexico	H.D. Rogers & Keith Johnson	1:3,450,000	ASU	4300.1857.R64	"Proposed Pacific Railway Route" through Zuni to Jacob's Well to Puero and LCR; Navajo Spr not shown; Moquis indicated but little detail in this portion	Photocopy is reduced so actual scale of copy is different; "Approximate Position of Great Colorado;" LCR relatively correct
1859	Territory and Military Department of New Mexico compiled in the Bureau of Topog Engns of the War Dept chiefly for military purposes under the authority of Hon. J. B. Floyd, Sec. of War	War Department	ca. 1:2,880,000	ASU (AHF), NA 77	4300.1866.U51/ NA RG 77	"Deale Wagon Road Route 1858 [? date unclear];" Jacob's Well and Navajo Spr;	Sitgreaves, Beckwith, Leroux and other military routes; Moqui Pueblos are located but little topographic detail to north and west of Hopi; Spanish Trail to Santa Fe in Utah
1860	Map of Explorations and Surveys in New Mexico and Utah made under direction of Secretary of War	Capt. J. N. Macomb, Top. Engs.	1:760,320	NA	RG 49	Whipple 1853 Route through Zuni to Jacobs Well, Navajo Spr, Puero; Maj. Shepard 1859 Route from Fort Defiance to Pueblo Grande, Lara Spr	Moquis Pueblos located, Ives 1853 Route

Date	Name	Publisher/Cartographer	Scale	Archive	Catalog Number	ONHIR Notes	Other Notes
1862	Sketch of Public Surveys of New Mexico	Surveyor General	ca. 1:1,900,800	NA	RG 75	"Whipples Route to California (Not Considered Practicable)" through Zuni to Rio Puerco; Area south of Zuni "Unexplored"	Moqui Pueblos indicated; Ives Route plotted; Little detail to north or west of Hopi; Cataract Cr. depicted flowing into LCR
1864	Johnson's California with Territories of Utah, Nevada, Colorado, New Mexico, and Arizona	Johnson and Ward	ca. 1:3,484,800	ASU	G4330.H5X.Folio.x7&15	Beal Road from Zuni to Navajo Spr rejoins "Sitgreaves 1851" Route at Salt Spr on LCR; Sitgreaves route follows Zuni River to LCR; no Jacob's Well	Moqui Pueblos are located; Hydrology of Colorado Chiquito & Colorado R. is not accurate; Spanish Trail from Los Angeles to Abiqui, New Mexico
1864	Map of the Military Department of New Mexico Drawn under the direction of Brig. Gen. James H. Carleton	Capt. Allen Anderson, 5th U.S. Infantry	ca. 1:2,217,600			Beale Road from Zuni to Jacob's Well, Navajo Spr, Carrizo Cr., LCR; Beckwith 1849 route; Sitgreaves 1852 route down Zuni R., LCR; two trails to Zuni Salt Lake	Escalante 1776 route; Bell 1858 route to Hopi villages; Ives route; Facsimile purchased at Tucson Map and Flag, 1994
1867	New Mexico Old Territory & Military Dept of 1858 Partially Revised and Corrected to 1867	U. S. Army	1:2,150,000	ASU (Hayden)	4300.1867.U51	Whipple's route from Zuni to Jacobs Well & LCR; Beckwith 1849 route; Sitgreaves 1852 route; route from Zuni to Zuni Salt Lake	Ives 1858 route; Escalante's route from San Juan to Oraibi
1867	National Map of the Territory of the United States from the Mississippi River to the Pacific Ocean ... Made ... In the Office of the Indian Bureau, Chiefly for Government Purposes ... Under Direction of N. G. Taylor, Commr of Indian Affairs	W. J. Keeler, Departments of the Government, Washington	1:2,280,960	NA	RG 75	Shows generalized route through Zuni to Puerco; Jacobs Well & Navajo Spr on map but not on route shown;	Moquis Villages indicated, Oraibe located; Colorado Chiquito shown flowing into Cataract Cr.; Some other military routes; Photocopy is 90%; scale is original map scale
1869	Map of the Route ... Zuni to Camp Reno [military map]	Colly, Dodd & Franklin 1st Lt. Lafferty	1:760,320 ca. 1:3,358,080	ASU ASU	4332.C42.1869A 4332.C42.1869	Military route down Zuni River Beale Road; Zuni, Navajo Spr; two trails from Zuni to Salt Lake	Military sketch map Moquis Pueblos labeled but no topographic or hydrologic detail north of LCR
1870	Colton's California, Nevada, Utah, Colorado, Arizona, & New Mexico	G.W. & C.B. Colton & Co.	1:3,168,000	ASU	4300.18797.C64	Route of A&P Railroad along Puerco R.; Moquis Indians labeled above Puerco; Zuni Pueblo located	Cosinas Indians located to northwest of Moquis Indians near junction of Marble Canyon and Colorado Chiquito
1873	Colton's New Mexico and Arizona	G.W. & G.B. Colton	1:2,090,880	ASU	4300.1873	Jacobs Well; Navajo Spr, Salt Lake; Deer Spr; A&P route along Puerco R, Surveyed by Aubrey; Zuni located but not Hopi	Little Colorado (Colorado Chiquito), San Juan, and Colorado R are not plotted correctly
1876	Territory of Arizona	General Land Office, DOI	1:1,140,480	ASU	4330.1876.U64A	Deer Spring	Moen Kapi Cr; Shinimo Altar; LCR drainage accurate all the way to Colorado R; Area around St. Johns plotted
1876	Territory of New Mexico	General Land Office	1:1,013,760	ASU	4320.1876.U64.e2.AZCA	Route of railroad along Puerco; shows Zuni but little other detail in Zuni area	Photocopy reduced, so scale of copy is ca. 1:1,448,228
1878	Atlas Sheet 77, Wheeler 1878	Wheeler	1:506,880				Acoma and Salt Lake Trail; Need to examine entire map for other details
1878	Parts of Eastern Arizona and Western New Mexico Atlas Sheet No. 76	Wheeler	1:506,880			Whipple Route 1853-4 from Zuni to Jacobs Well, Navajo Spr, Puerco; Trail from Zuni to Salt Lake, Labeled "Prescott and Santa Fe Mail Route; Route by Arch Spr to Puerco	Need to check provenience; examine entire map
1878	Map prepared for R. J. Hinton's Handbook of Arizona		ca. 1:1,140,480	ASU	4330.1878.115	Beale Road through Jacob's Well and Navajo Spr; trail from Moqui Pueblos to Pottery Hill with SE spur through Jara Spr to Beale Road crosses Carrizo Cr (Dead Wash); Beale Road not plotted entirely correct in relation to Carrizo Cr	Trail from Oraibi to Colorado River ca. 9 miles west of Lee's Ferry; Trail from Oraibi to Echo Cliffs ca. 18 miles from Salt Trail Canyon; Trail from Oraibi to LCR near Grand Falls

Date	Name	Publisher/Cartographer	Scale	Archive	Catalog Number	ONHIR Notes	Other Notes
1879	Territories of New Mexico and Arizona	Chief of Engineers, U.S.A.	ca. 1:2,112,000	NA	RG 77	Route from Zuni to Jacobs Well, Navajo Spr, La Jara Cr. Puerto, LCR; Trail from Zuni to Salt Lake; Trail past Deer Spr. along route of Kiatutsuma trail	Trail from Oraibi to "Moen Copi" to Lees Ferry and Echo Cliffs; "Old Moqui Trail" to Havasupai; "Moqui Trail" to LCR downstream of Black Falls Photocopy is 85% of original; scale is of photocopy; Very detailed map
1879	Territory of Arizona	General Land Office	1:1,140,480	NA	RG 75	Route from Puerto to Jacobs Well, Navajo Spr back to Puerto, not connected to Zuni; A&P Railroad Route along Rio Puerto;	"Proposed Reservation for Moqui..." penciled onto map; Trail from Oraibi to Moen Copie Cr. to Lee's Ferry, to Echo Cliffs; to Shenomo Altar; Photocopy is 90% of original; scale is original map
1880	Official Map of the Territory of Arizona, Compiled from Surveys, Reconnaissances, and other Sources	E.A. Eckhoff and P. Riecker, Civil Engineers, NY	ca. 1:950,400			Beale Road from Zuni to Jacobs Well, Navajo Spr, Carrizo, Puerto, LCR; Road down Zuni R. past Deer Spr;	Trail from Oraibi to Moen Ava to LCR, "Moqui Trail" fr. Lees Tank to Red Butte, Rain Tank, Supai; Trail fr. Oraibi to Lee's Ferry; Mormon Wagon Rd; Facsimile purchased at Tucson Map and Flag, 1994
1881	County and Township Map of Arizona and New Mexico	Augustus Mitchell	1:1,900,800	INAW		Route from Puerto to Jacobs Well, Navajo Spr back to Puerto, not connected to Zuni	Trail from Oraibi to Moen Copie Cr and Mormon Wagon Road to Lee's Ferry
1884	Map of Territory of Arizona		1:1,457,280	ASU	4330.1941.56	Beale Road to Jacob's Well & Navajo Springs; Road SE from Jacob's Well to Kiatututuma Trail	Road from Oraibi to Lee's Ferry; Moen Ava; platted areas; Republished by Southwestern Sash & Door CO. in 1941
1885	Northwestern New Mexico	Office of the Chief Engineer, Dept of the Missouri	ca. 1:570,240	NA	Record Group 22	Beale Road; Zuni; Jacob's Well; Navajo Springs; Deer Spr; Trail to Salt Lake	Scale of copy may be 80% of original scale, i.e., the copy has been reduced; this map has accurate topography and hydrology
1886	Arizona, Tusayan Sheet	USGS	1:250,000	USGS		Road running to Jeddito & White Cone Springs	Shows road from Oraibi to north of Howell Mesa; trail network depicted from Hopi villages
1888	Railroad and County Map of Arizona		ca. 1:1,520,640	ASU	4331.P3.AZCA	Navajo P. O. along A&P Railroad near Navajo Spr; Road parallel to railroad on north from state line to just east of Cottonwood drainage	Moen Kapi Cr (not correctly plotted); Sheome Altar; Tuba City; Hopi Reservation
1888	Arizona, Rand, McNally & Co. Atlas of the World	Rand, McNally & Company	ca. 1:1,774,080	ASU	G4330.H5X.Folio.x/8	Beale Road through Jacobs Well, Navajo Spr to Puerto & LCR; Road down Zuni River by Deer Spr; Moquis Pueblos	Trail from Oraibi to Lee's Ferry via Hatches Well, Tossand Wells, Navajo Spr; Trail from Oraibi to Moen Ava joins Mormon Wagon Road from Lee's Ferry to Winslow; Trail from "Settlements [Moenkopi] past Lava Butte across LCR west past Red Butte to Supai
1889	Railroad and County Map of New Mexico	Geo. F. Cram	ca. 1:2,280,960	ASU	4321.F7.1889	Deer Spr	Zuni Salt Lake; Nutria outside Zuni Res
1892	Ariz-N.M. Fort Defiance Sheet	USGS	1:250,000	USGS		Road from White Cone to Tanner Spr to Navajo Spr to Jacobs Well; Road from Tanner Spr to Sanders and beyond	
1892	New Mexico, Wingate Sheet	USGS	1:250,000	UNNM Lib.	G Ref	Beale Road west of Zuni	Trail network to north, east, south of Zuni
1991	Western Emigrant Trails	Oregon-California Trails Association	ca. 1:9,051,428			Beale Road from Albuquerque to Fort Mohave; generalized depiction	
	Watson's Atlas Map of New Mexico	Watson's Atlas	ca. 1:2,280,000	ASU	G4330.H5X.Folio		Nutria is outside Zuni Reservation boundary; Population of NM is 119,565
	Arizona, Oregon, Washington, Utah & New Mexico	McNally	ca. 1:9,504,000	ASU	G4330.H5X.Folio x13L	No details west of Zuni	New Mexico extends all the way to California; drainages approximately correct
	Spanish Dominions in North America		ca. 1:14,621,500	ASU	G4330.H5X.Folio X/3A	"Alona" [Zuni Pueblo] appears on map	Very little topographic, hydrologic detail

<i>Date</i>	<i>Name</i>	<i>Publisher/Cartographer</i>	<i>Scale</i>	<i>Archive</i>	<i>Catalog Number</i>	<i>ONHIR Notes</i>	<i>Other Notes</i>
	Watson's Atlas Map of Arizona	Watson's Atlas	ca. 1:2,280,000	ASU	G4330.H5X Folio	Railroad is present; Navajo Spr; Deer Spr	Hopi Reservation; Population of state is 40,440; Moen Copi Cr.; Moen Ave; Willow Spring Shenomo Allar
	Arizona and New Mexico		1:3,801,600	ASU	G4330.H5X	Route from Zuni to Navajo Spr then a long LCR	Hopi absent; Spanish Trail from Santa Fe to Pacific/Caravan Route from Mississippi